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Dated 8 April 2003

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1/77

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P01/7700 0.00-0217382.1

Request for grant of a patent

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The Patent Office

Cardiff Road
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1. Your reference

PCS25042WMD-PROV

2. Patent application number
(The Patent Office will fill in this part)

26 JUL 2002

0217382.1

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

PFIZER LIMITED
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06892643001
Patents ADP number *(if you know it)*

United Kingdom

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

PROCESS FOR MAKING ORALLY CONSUMABLE DOSAGE FORMS

5. Name of your agent *(if you have one)*

DADSON, William Michael

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

UK Patent Department
Ramsgate Road,
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United Kingdom

Patents ADP number *(if you know it)* 08433799001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number	Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

Patents Form 1/77

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Continuation sheets of this form	
Description	11
Claim(s)	3
Abstract	1
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Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature W. M. Dadson Date 26 July 2002

W. M. Dadson

12. Name and daytime telephone number of person to contact in the United Kingdom: W M Dadson - 01304 648995

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PROCESS FOR MAKING ORALLY CONSUMABLE DOSAGE FORMS

The present invention is concerned with a process for making rapidly dissolving and dispersing orally consumable dosage forms, particularly films, for the delivery of pharmaceutically active agents and with the dosage forms so obtained.

The use of orally consumable dosage forms, particularly films, to deliver pharmaceutically active agents is well known in the art.

Thus WO 98/20862 describes a preparation for application in the oral cavity with one layer or film which adheres to the mucous membrane, characterised in that the adhesive layer or film contains a homogenous mixture consisting of a water soluble polymer, a mixture of non-ionic surface active materials, a polyalcohol, a cosmetic or pharmaceutical active substance, and a food flavouring or aromatic agent.

WO 98/26780 describes a solid medicament preparation which can decompose in aqueous media and has a flat-, foil-, paper- or wafer-type presentation for the application and release of active substances in the buccal cavity. The invention is characterised in that it contains buprenorphine, an active substance which is pharmacologically comparable thereto, or a therapeutically suitable salt of buprenorphine or of the pharmacologically comparable active substance.

WO 98/26763 describes a medicament preparation with a flat-, paper- or wafer-like presentation for the application and release of active substances into the buccal cavity. The preparation is characterised in that it contains apomorphine or one of its therapeutically suitable salts.

WO 99/17753 describes a rapidly soluble filmy preparation comprising a drug, an edible and readily soluble high-molecular substance and a sugar which is rapidly soluble in the oral cavity.

WO 00/18365 describes physiologically acceptable films, including edible films, which include a water soluble film-forming polymer such as pullulan. Edible films including pullulan and antimicrobially effective amounts of the essential oils thymol, methyl salicylate, eucalyptol and menthol are effective at killing the plaque-producing germs that cause dental plaque, gingivitis and bad breath. The film can also contain pharmaceutically active agents.

WO 01/70194 describes physiologically acceptable films, including edible films, which include a water soluble film-forming polymer, such as pullulan, and a taste masked pharmaceutically active agent, such as dextromethorphan. The taste masking agent is preferably a sulphonated polymer ion exchange resin comprising polystyrene cross-linked with divinylbenzene, such as Amberlite™.

WO 01/70194 describes a method for preparing the consumable film of the invention which comprises

(a) dissolving water-soluble ingredients in water to provide an aqueous solution;

(b) mixing at least one water soluble film former and at least one stabilising agent to provide a film-forming mixture;

(c) combining the film-forming mixture and the aqueous solution to provide a hydrated polymer gel;

(d) mixing oils to form an oil mixture;

(e) adding the oil mixture to the hydrated polymer gel and mixing to provide a uniform gel;

(f) casting the uniform gel on a substrate; and

(g) drying the cast to provide the film.

The difficulty associated with a process of this type is that it requires the preparation of a high viscosity composition (gel) in order to achieve a satisfactory cast and, in consequence, the resulting dosage form (film) gives rise to a viscous solution when placed in the mouth of the consumer. This may be satisfactory for the delivery of oral healthcare products, such as mouthwashes, which are intended to remain in the mouth for some time, but such dosage forms do not lend themselves to the delivery of pharmaceutically active compounds which need to be rapidly dissolved and dispersed as soon as the dosage form is placed in the mouth. In other words, the high viscosity necessary for casting militates against the preparation of dosage forms which rapidly dissolve and disperse in the mouth.

We have now found that by appropriate choice of film-forming components, specifically pullulan and sodium alginate, it is possible to provide a composition having the high viscosity necessary for casting which, by suitable treatment after casting, gives an orally consumable dosage form capable of providing a low viscosity solution when placed in the mouth of the consumer. Thus there is provided a process for the manufacture of orally consumable dosage forms capable of rapidly dissolving and dispersing in the mouth which dosage forms have good handling properties during manufacture. The orally consumable dosage forms so obtained may be used for the administration of pharmaceutically active agents to both humans and animals. Of the latter, companion animals, particularly cats, dogs and horses, are considered especially suitable for the administration of drugs in this way.

Viscosity (Pa.s) may be defined as the shear stress (Pa) of a solution or composition divided by the shear rate (s^{-1}) at which the shear stress is measured.

For the purposes of this invention, the terms "high" and "low" viscosity are defined in terms of the difference in shear stress between the composition used for casting and that of the solution formed in the mouth. The term "low" is employed when the viscosity of the solution formed in the mouth is less than 80% that of the composition used for casting, both being measured at a shear rate of $100s^{-1}$ and, in respect of the latter, after the composition used for casting has been allowed to stand for 1 day. [It is not a necessary feature of the invention that the casting solution be allowed to stand for this period, but it serves as a convenient point in time at which to measure viscosity.]

By way of example, the viscosities of compositions in accordance with the invention comprising 20 wt% pullulan and different amounts of sodium alginate are shown in the following table:

%w/w sodium alginate	Viscosity		% reduction in viscosity
	At pH 3.5	At pH 7.0	
0.5	378	297	21
1.0	826	549	33
2.0	1666	1001	40

It may be seen that compositions having a pH of 7.0, that is, approximating to the pH of the mouth, have viscosities at least 20% less than those observed at pH 3.5, the preferred pH of the compositions used for casting.

According to the present invention, therefore, there is provided a process for preparing an orally consumable dosage form which provides a low viscosity solution when placed in the mouth of the consumer, which process comprises the steps of

(a) preparing a hydrated polymer composition comprising pullulan, sodium alginate and one or more pharmaceutically active agents;

(b) adjusting the pH of said composition to a pH in the range 3.5 to 4.5 by the addition of a suitable volatile acid;

(c) casting said composition into the shape of an orally consumable dosage form; and

(d) drying said dosage form under such conditions as to volatilise the acid and provide a dosage form which rapidly dissolves and disperses in the mouth of the consumer.

At the pH of the mouth (6.4 - 8.0), the resulting dosage form, for example, an orally consumable film, dissolves in the mouth to form a low viscosity solution which is capable of rapidly dispersing the pharmaceutically active agent contained therein.

For the purposes of the present invention, the term "pharmaceutically active agent" is used to describe any drug which is suitable for the treatment of a human or an animal and includes oral healthcare actives such as deodorising agents, anti-microbial agents and salivary stimulants.

In step (b), the composition is adjusted to a pH in the range 3.5 to 4.5, preferably from 3.5 to 4.0, most preferably about 3.5, using a suitable "volatile acid" and is typically cast (step (c)) within 24 hours of preparation. The term "volatile acid" is used herein to describe an acid which is wholly or substantially wholly removed (>95%), typically within 24 hours of casting, under the drying conditions of step (d). Suitable volatile acids for the purposes of the invention include hydrochloric, acetic and formic acids.

Drying conditions for the purposes of step (d) include a fan oven at a temperature of from 50°C to 80°C, preferably about 60°C, for from 15 to 90 minutes or a coating machine, such as a Labcoater Type LTE-S manufactured by Werner Mathis AG Oberhasli Switzerland or similar, at a temperature of from 20°C to 150°C.

It can be envisaged that the requirement of the present invention that the solution produced in the mouth should have a lower viscosity than the composition used for casting could be achieved by means other than adjusting the pH, for example, by using (1) radiation, (2) heating or cooling, (3) the addition/removal of electrolytes, or (4) enzymatic degradation:

(1) Some materials are known to be unstable to irradiation. Xanthan gum formulations, for example, reduce in viscosity when exposed to gamma-radiation. Thus a viscous mixture of pullulan and xanthan could be used for casting and the viscosity of the xanthan component subsequently reduced by irradiation to give a dosage form having the desired properties of rapid dissolution and dispersion.

(2) Some materials exhibit rheological properties which are temperature dependent. Carrageenan, for example, has a structure which is readily disrupted by an increase in temperature. A high viscosity, low temperature composition could be used for casting and heat applied during subsequent drying to disrupt the structure. The significantly reduced molecular mobility in the dried film would inhibit the rate of reformation of the structure. By judicious choice of heating and drying rates, it would be possible to balance the rate of viscosity loss on heating with the rate of viscosity increase on drying and ultimately trap the low viscosity form. On rehydration in the mouth, the lifetime of the product is relatively short and the low viscosity product would be dispersed before equilibrium thickening occurred.

(3) Electrolytes can also be used to modify the rheological properties of materials. For example, adding calcium ions to alginates and pectins can lead to thickening and gelation. Similarly, the properties of carboxymethyl

cellulose and chitosan can be modified by the presence or absence of electrolytes. The binding of ionic species, for example, by chelation, during the period between casting and use would provide a dosage form which, when placed in the mouth, gave rise to a solution having lower viscosity than the composition used for casting.

(4) In the manufacture of soft centre chocolates, a thick paste containing an enzyme is used to form the centre of the confection. In the period between manufacture and consumption, the enzyme degrades the substance of the paste to yield a liquid centre. Such a system could be exploited to make dosage forms for use in oral healthcare and as therapeutic dosage forms.

Also within the scope of the invention are orally consumable dosage forms, particularly films, prepared by the process of the invention. Protection is especially sought for orally consumable dosage forms containing ibuprofen, ivermectin, or any form of eletriptan including the free base and salts thereof. Dosage forms wherein the pharmaceutically active agent is the anti-migraine drug Relpax™ (eletriptan hydrobromide) or the hemisulphate of eletriptan are particularly preferred.

The orally consumable dosage forms of the invention typically comprise the film-forming agents pullulan and sodium alginate, a pharmaceutically active agent and at least one of the following additional agents: plasticising agent, saliva-stimulating agent, cooling agent, surfactant, emulsifying agent, sweetener, flavouring and/or fragrance, colouring agent, preservative, triglyceride, a polyethylene oxide and propylene glycol.

Pullulan is a bioadhesive polysaccharide commonly employed in the preparation of orally consumable dosage forms and is used in the dosage forms of the invention in an amount of up to 70 wt%, preferably from 5 to 45 wt% and most preferably from 15 to 25 wt%.

Sodium alginate is a naturally-occurring copolymer of mannuronic and guluronic acid salts. It is water-soluble above pH 4.5, but under more acidic conditions is converted to the insoluble but water-swellable alginic acid. It is used in the dosage forms of the invention in an amount of up to 5.0 wt%, preferably from 0.1 to 2.5 wt% and most preferably about 0.5 wt%.

Pharmaceutically active agents which may be delivered using orally consumable dosage forms prepared by the process of the invention include

analgesic anti-pyretics;
anti-diarrhoeals;
anti-histamines;
anti-microbials;
anti-Parkinsonism drugs;
anti-tussives;
decongestants;

drugs which selectively modify CNS function;
expectorants;
general non-selective CNS depressants;
general non-selective CNS stimulants;
H_2-antagonists;
narcotic analgesics;
non-steroidal anti-inflammatory drugs;
oral insulin;
proton pump inhibitors; and
psychopharmacological drugs.

Specific examples of the foregoing drugs are to be found in the aforementioned WO 01/70194 and are included herein by reference.

Other actives which may be delivered using dosage forms prepared according to the process of the invention include

anti-emetics, for example, ondansetron;
anti-fungals, for example, fosfluconazole;
anti-infectives other than anti-microbial agents, for example, azithromycin;
anti-inflammatories, for example, Rimidil™;
anti-parasitic agents, for example, Pyrantel™;
anti-pyretics other than analgesic anti-pyretics;
appetite stimulants, for example, megatrol acetate;
cardiovascular drugs (including anti-hypertensives), for example, Norvasc™; and
drugs for renal failure, for example, frusemide.

Moreover, more than one type of pharmaceutically active agent may be included in the dosage form of the invention. For example, a dosage form containing an anti-tussive may also contain an anti-histamine, a nasal decongestant or bronchodilator, an analgesic, an anti-inflammatory, a cough suppressant and/or an expectorant.

The amount of pharmaceutically active agent provided in each orally consumable dosage form is obviously dependent on the dose needed to provide an effective amount of the agent. Furthermore, the amount provided may be adjusted to deliver a predetermined dose over a predetermined period of time. Typical concentrations for pharmaceutical and veterinary products are in the range 0.1 to 50% w/w; up to 75% w/w is possible. Typical doses which can be delivered per orally consumable dosage form are in the range 10µg to 100mg.

The dosage form of the invention may also be used to deliver oral healthcare products such a deodorising agents, anti-microbial agents, or salivary stimulants. Typical concentrations for oral healthcare products are in the range 0.1 to 15% w/w; typical doses which can be delivered per orally

consumable dosage form are comparable to those for pharmaceutical and veterinary products, *viz.* from 10µg to 100mg.

As indicated, preferred pharmaceutically active agents for delivery using an orally consumable dosage form prepared by the process of the invention include ibuprofen, ivermectin and any form of eletriptan, particularly the anti-migraine drug Relpax™ (eletriptan hydrobromide) and eletriptan hemisulphate. An orally consumable dosage form, typically a film, prepared according to the process of the invention may be administered to a migraine sufferer in need of treatment so as to deliver an effective amount of Relpax™. For such purposes, the typical adult dose of Relpax™ for a film prepared by the process of the invention measuring 2.2cm x 3.2cm and weighing from 60 to 190mg is in the range 5 to 80mg.

Preferred plasticising agents include monoacetin, diacetin and triacetin, polyalcohols, such as glycerol and glycerol monoesters, and sorbitol, which may be present in the dosage forms of the invention in an amount of from 0 to 20 wt%, preferably from 0 to 2 wt%.

Preferred saliva-stimulating agents include citric, lactic, malic, succinic, ascorbic, adipic, fumaric and tartaric acids which may be present in the dosage forms of the invention in an amount of from 0.01 to 12 wt%, preferably from 1 to 10 wt% and most preferably from 2.5 to 6 wt%.

Preferred cooling agents include monomenthyl succinate, WS3, WS23 and Ultracool II which may be present in the dosage forms of the invention in an amount of from 0.001 to 2.0 wt%, preferably from 0.2 to 0.4 wt%.

Preferred surfactants include mono- and diglycerides of fatty acids, polyoxyethylene sorbitol esters and di- and tri-block copolymers, such as pluronics, which may be present in the dosage forms of the invention in an amount of from 0.5 to 15 wt%, preferably 1 to 5 wt%.

Preferred emulsifying agents include triethanolamine stearate and quaternary ammonium compounds which may be present in the dosage forms of the invention in an amount of from 0 to 5 wt%, preferably from 0.01 to 0.7 wt%.

Suitable sweeteners, both natural and artificial, may be used in the dosage forms of the invention in an amount effective to provide the desired level of sweetness. This amount will typically be in the range of from 0.01 to 10 wt%, preferably from 2 to 5 wt%.

Suitable flavourings and/or fragrances include those well known in the art, both natural and artificial, which may be used in the dosage forms of the invention in an amount sufficient to give the desired flavour/fragrance. This amount will typically be in the range of from 0.1 to 30 wt%, preferably from 2 to 25 wt%, most preferably from 8 to 10 wt%.

Suitable colouring agents include those well known in the art, for example, titanium oxide, which may be used in the dosage forms of the invention in an amount sufficient to give the desired colouring. This amount will typically be in the range up to about 5 wt%, preferably less than 1 wt%.

Preferred preservatives include sodium benzoate and potassium sorbate which may be present in the dosage forms of the invention in an amount of from 0.001 to 5 wt%, preferably from 0.01 to 1 wt%.

The dosage forms of the invention may also include a triglyceride, such as olive oil, which may be present in an amount of from 0.1 to 12 wt%, preferably from 0.5 to 9 wt%. They may also contain a polyethylene oxide such as N-10 (Union Carbide) having a MW of from 50,0000 to 6,000,000 which may be present in an amount of from 0.1 to 5 wt%, preferably from 0.2 to 4.0 wt%.

Finally, the dosage forms of the invention may contain propylene glycol in an amount of from 1 to 20 wt%, preferably from 5 to 15 wt%.

It is preferable to avoid substantial amounts of humectants in dosage forms having a relatively high oil content. In such cases, it is advisable to use a plasticiser other than glycerin and a sweetener other than sorbitol, both of which are known humectants.

Step (a), preparation of the hydrated polymer composition, is typically carried out by (i) mixing the film-forming ingredients in water and allowing to hydrate, (ii) dissolving the water-soluble ingredients in water and adding the aqueous solution to the resulting gel and (iii) mixing in the organic ingredients and surfactants.

For the purposes of step (i), the film-forming ingredients, typically comprising pullulan and sodium alginate, are mixed in water, preferably deionised and at a temperature of from 10°C to 90°C, and allowed to hydrate for from 30 to 48 hours to form a gel. The resulting gel contains from 40 to 80% of water and is cooled to 20-30°C over a period of from 1 to 48 hours.

For the purposes of step (ii), the water-soluble ingredients, typically comprising the pharmaceutically active agent, colouring agent, preservative and sweetener, are dissolved in deionised water at a temperature of from 25°C to 45°C. The amount of water used is typically from 5 to 80 wt% of the final composition.

Alternatively, the water-soluble ingredients may be dissolved in water to which the film-forming ingredients and the organic ingredients and surfactants are added to hydrate.

The pH of the mixture is then adjusted to a pH in the range 3.5 to 4.5, preferably 3.5 to 4.0, most preferably about 3.5, using a volatile acid as defined herein and the mixture emulsified by vigorous stirring.

For the purpose of making an orally consumable film in accordance with the invention, the resulting composition is cast, typically within 24 hours of preparation, on a suitable substrate, typically a glass platen or similar, preferably covered with a suitable release paper. The film is then dried, typically within 24 hours of casting, in a fan oven at about 80°C for from 15 to 90 minutes or in a coating machine, such as a Labcoater Type LTE-S manufactured by Werner Mathis AG Oberhasli Switzerland or similar, at a temperature of from 20°C to 150°C, cut to the desired dimensions, packaged and stored. The film will ideally contain from 0.1 to 10 wt% moisture, preferably from 3 to 8 wt% and most preferably from 4 to 7 wt%.

The invention is illustrated by reference to the following Examples which are not intended to be limiting in any way.

PHARMACEUTICAL EXAMPLE 1

A 20 wt% pullalan/1.0 wt% sodium alginate composition was prepared as follows:

Pullulan (20.0g) and sodium alginate (1.00g) were added to deionised water (100ml) and the mixture left to stand overnight. The pH of the resulting gel was adjusted to 3.5 using dilute hydrochloric acid. To 31.7g of the gel was added ibuprofen (3.5g) and the mixture stirred vigorously to give a white gel.

A film in accordance with the invention was prepared by applying the gel to a glass plate using a CAMAG hand-operated coater having a 0.5mm gate. The resulting film was dried in a fan oven at 80°C for 30 minutes.

When dry, the film provided an ibuprofen concentration of 36.6% w/w, that is, about 32mg of ibuprofen in a film 2.2cm x 3.2cm.

To 25.8g of unused gel were added glycerol (0.28g) and a second film prepared in the same way. When dry, the film provided an ibuprofen concentration of 35.0% w/w, that is, about 32mg of ibuprofen in a film 2.2cm x 3.2cm. The resulting film was less brittle, i.e. less prone to cracking, than that obtained without glycerol.

When placed in the mouth, the rehydrated films both gave low viscosity solutions which rapidly dissolved and dispersed.

PHARMACEUTICAL EXAMPLE 2

A 21 wt% pullalan/1.1 wt% sodium alginate composition was prepared as follows:

Pullulan (20.0g), sodium alginate (1.00g), potassium sorbate (0.07g) and glycerol (1.25g) were added to deionised water (95ml) and the mixture left to stand overnight. The pH of the resulting gel was adjusted to 3.5 using dilute

hydrochloric acid. To 31.7g of the gel was added ibuprofen (3.17g) and the mixture stirred vigorously to give a white gel.

A film in accordance with the invention was prepared by applying the gel to a glass plate using a CAMAG hand-operated coater having a 0.5mm gate. The resulting film was dried in a fan oven at 80°C for 30 minutes.

When dry, the film provided an ibuprofen concentration of 34.5% w/w, that is, about 32mg of ibuprofen in a film 2.2cm x 3.2cm.

When placed in the mouth, the rehydrated film gave a low viscosity solution which rapidly dissolved and dispersed.

ORAL HEALTHCARE EXAMPLE

A 20 wt% pullalan/1.0 wt% sodium alginate composition was prepared as follows:

Pullulan (20.0g) and sodium alginate (1.00g) were added to deionised water (79ml) and the mixture left to stand overnight. The pH of the resulting gel was adjusted to 3.5 using dilute hydrochloric acid. To 35g of the gel was added eucalyptol (0.06g), *l*-menthol (0.6g), methyl salicylate (0.04g), thymol (0.04g) and mint oil (0.8g) and the mixture stirred vigorously to give a white gel.

A film in accordance with the invention was prepared by applying the gel to a glass plate using a CAMAG hand-operated coater having a 0.25mm gate. The resulting film was dried in a fan oven at 80°C for 30 minutes.

When dry, the film provided concentrations and weights/film of eucalyptol (0.06g), *l*-menthol (0.6g), methyl salicylate (0.04g), thymol (0.04g) and mint oil (0.8g) of

Ingredient	Concentration (% w/w)	Weight/film (mg)
Eucalyptol	0.67	0.29
l-Menthol	6.75	2.89
Methyl salicylate	0.45	0.19
Thymol	0.45	0.19
Mint oil	9.0	3.85

in a film 2.2cm x 3.2cm.

When placed in the mouth, the rehydrated film gave a low viscosity solution which rapidly dissolved and dispersed.

VETERINARY EXAMPLE

A 20 wt% pullalan/1.0 wt% sodium alginate composition was prepared as follows:

Pullulan (20.0g), sodium alginate (1.00g), glycerol (2.5g) and potassium sorbate (0.14g) were added to deionised water (100ml) and the mixture left to stand overnight. The pH of the resulting gel was adjusted to 3.5 using dilute hydrochloric acid. To 15ml of the gel was added a solution of ivermectin (3.4mg) in methanol (0.75ml) and the mixture stirred vigorously to give a translucent gel.

A film in accordance with the invention was prepared by applying the gel to a glass plate using a CAMAG hand-operated coater having a 0.5mm gate. The resulting film was dried in a fan oven at 80°C for 16 minutes.

When dry, the film provided an ivermectin concentration of 0.12% w/w, that is, about 76µg of ivermectin in a film 2.2cm x 3.2cm.

When placed in the mouth of a dog, the rehydrated film gave a low viscosity solution which rapidly dissolved and dispersed.

CLAIMS

1. A process for preparing an orally consumable dosage form which provides a low viscosity solution when placed in the mouth of the consumer, which process comprises the steps of

   (a) preparing a hydrated polymer composition comprising pullulan, sodium alginate and one or more pharmaceutically active agents;

   (b) adjusting the pH of said composition to a pH in the range 3.5 to 4.5 by the addition of a suitable volatile acid;

   (c) casting said composition into the shape of an orally consumable dosage form; and

   (d) drying said dosage form under such conditions as to volatilise the acid and provide a dosage form which rapidly dissolves and disperses in the mouth of the consumer.

2. A process according to Claim 1 wherein the solution formed upon dissolution of the resulting dosage form in the mouth of the consumer has a viscosity which is less than 80% that of the composition formed in step (b).

3. A process according to Claim 1 or 2 wherein the pharmaceutically active agent is suitable for human or veterinary use.

4. A process according to Claim 1 or 2 wherein the pharmaceutically active agent is an oral healthcare product.

5. A process according to any of Claims 1 to 4, wherein the pH of the composition is adjusted to a pH in the range 3.5 to 4.0.

6. A process according to Claim 5, wherein the pH of the composition is adjusted to a pH of 3.5.

7. A process according to any of Claims 1 to 6, wherein the volatile acid is hydrochloric acid, acetic acid, or formic acid.

8. A process according to any of Claims 1 to 7, wherein step (d) is carried out at a temperature of from 50°C to 80°C for a period of from 15 to 90 minutes.

9. A process according to any of Claims 1 to 7, wherein step (d) is carried out in a coating machine at a temperature of from 20°C to 150°C.

10. An orally consumable dosage form obtained according to a process described in any of Claims 1 to 9.

11. A dosage form according to Claim 10, wherein pullulan is present in an amount of from 15 to 25 wt%.

12. A dosage form according to Claim 11, wherein pullulan is present in an amount of 20 wt%.

13. A dosage form according to Claim 10, wherein sodium alginate is present in an amount of from 0.1 to 2.5 wt%.

14. A dosage form according to Claim 13, wherein sodium alginate is present in an amount of 0.5 wt%.

15. A dosage form according to any of Claims 10 to 14 wherein the pharmaceutically active agent is

an anti-diarrhoeal;
an anti-emetic;
an anti-fungal;
an anti-histamine;
an anti-infective (including anti-microbial agents);
an anti-inflammatory;
an anti-parasitic agent;
an anti-Parkinsonism drug;
an anti-pyretic (including analgesic anti-pyretics);
an anti-tussive;
an appetite stimulant;
a cardiovascular drug (including anti-hypertensives);
a decongestant;
a drug for renal failure;
a drug which selectively modifies CNS function;
an expectorant;
a general non-selective CNS depressant;
a general non-selective CNS stimulant;
an H_2-antagonist;
a narcotic analgesic;
a non-steroidal anti-inflammatory drug;
oral insulin;
a proton pump inhibitor; or
a psychopharmacological drug.

16. A dosage form according to Claim 15, wherein the pharmaceutically active agent is ibuprofen, ivermectin, or any form of eletriptan.

17. A dosage form according to Claim 16, wherein the pharmaceutically active agent is eletriptan hydrobromide (Relpax™) or eletriptan hemisulphate.

18. A dosage form according to any of Claims 15 to 17, wherein the pharmaceutically active agent is present at a concentration of from 0.1 to 75% w/w.

19. A dosage form according to any of Claims 10 to 14, wherein the pharmaceutically active agent is an oral healthcare product.

20. A dosage form according to Claim 19, wherein the oral healthcare product is one or more of a deodorising agent, an anti-microbial agent, or a salivary stimulant.

21. A dosage form according to Claim 19 or 20, wherein the oral healthcare product is present at a concentration of from 0.1 to 15% w/w.

22. A dosage form according to any of Claims 10 to 21, which dosage form is an orally consumable film.

ABSTRACT

The present invention is concerned with a process for making rapidly dissolving and dispersing orally consumable dosage forms, particularly films, for the delivery of pharmaceutically active agents and with the dosage forms so obtained.